

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2019/2020

**TBI 3131 – BUSINESS INTELLIGENCE**

( All sections / Groups )

25 OCTOBER 2019  
9.00 a.m. - 11.00 a.m.  
( 2 Hours )

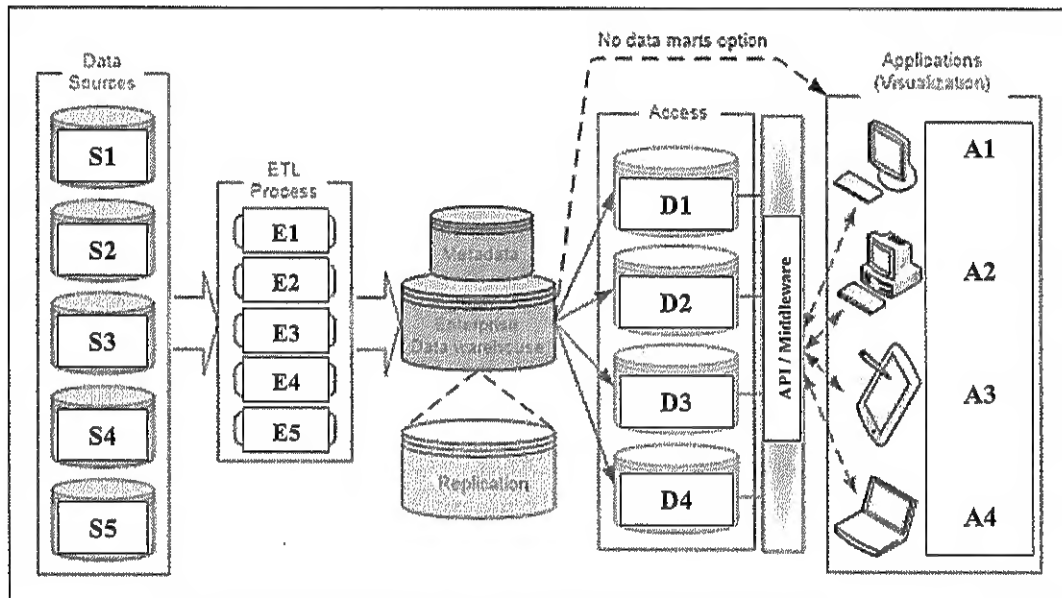
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**INSTRUCTIONS TO STUDENTS**

1. This Question paper consists of 5 pages excluding cover page with 5 Questions only.
2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

**QUESTION 1**

- a. Define the term of “Business Intelligence” (BI). (2 marks)
- b. Briefly describe the major components of BI. (2 marks)
- c. **Figure 1** describes a Generic Data Warehouse Framework. Label **S1, S2, S3, S4, S5** as examples of data sources, **E1, E2, E3, E4, E5** as the ETL Process, **D1, D2, D3, D4** as examples of data marts and **A1, A2, A3, A4** as examples of applications in the figure. (6 marks)



**Figure 1: Generic Data Warehouse Framework.**

Source: Sharda, R., Delen, D., Turban, E. (2014). *Business Intelligence: A Managerial Approach on Analytics 3/e*, Prentice Hall.

Continued .....

**QUESTION 2**

- a. Differentiate the **TWO (2)** competing development approach to develop an effective data warehouse for an organisation. (4 marks)
- b. **Table 1** is a table for Key Performance Indicators (KPI) for a Human Resource manager. (6 marks)

**Table 1: Key Performance Indicators (KPI) for Human Resource manager.**

No	Key Results Area	Key Performance Indicators	Weight	Target	Actual	Score	Final Score
1	Recruitment	Average lead time to recruit employees	30	60 days	80 days	75	
2	Training and Development	Training Hours per Employee / Year	20	40 hours/ year	50 hours/ year	125	
3	Performance and Career Management	% of employee that fully execute their Individual Development Plan	10	90%	80%	89	
		% of employee that participate in career coaching program	15	90%	80%	89	
4	Employee Retention and Productivity	% of employee that leave the organisation in a given time period	15	2%	3%	67	
		Profit per employee	A	RM 100,000	RM 80,000	80	
							B

Answer the following questions based on **Table 1**.

- List the **SIX (6)** distinguishing features of KPIs. (3 marks)
- What is A? (1 mark)
- What is B (Overall final score)? (2 marks)

**Continued .....**

**QUESTION 3**

- a. Why do you think there are many different types of charts and graphs? (2 marks)
- b. Complete the table below which shows the main differences between Bar charts, Pie charts, Bubble charts, Histograms, PERT charts, Bullet graphs, Heat maps and Tree maps and illustrate a sample for each of the charts and graphs. (8 marks)

	Type	Special Features	Sample
1	Bar charts		
2	Pie charts		
3	Bubble charts		
4	Histograms		
5	PERT charts		
6	Bullet graphs		
7	Heat maps		
8	Tree maps		

**QUESTION 4**

- a. As a business analyst, select the best business idea based on the following statistical data. (2 marks)

Business Idea	Success Rate	Gain (RM)	Loss (RM)
Delicious Cafe	35	10,000	-5,000
Yummy Stall	40	20,000	-7,000
Lovely Food Truck	25	30,000	-8,000

- b. Generate K-Means clustering for the following data points; assuming  $k = 3$ .

3, 5, 7, 8, 12, 15, 16, 28, 29

(4 marks)

- c. Explain **THREE** (3) main data mining methods and describe the fundamental differences among them? (4 marks)

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## QUESTION 5

Consider the following article for Luxottica.

### Big Data Analytics Helps Luxottica Improvement Its Marketing Effectiveness

Based in Mason, Ohio, Luxottica Retail North America (Luxottica) is a wholly owned retail arm of Milan-based Luxottica Group S.p.A, the world's largest designer, manufacturer, distributor and seller of luxury and sports eyewear. Employing more than 65,000 people worldwide, the company reported net sales of EUR6.2 billion in 2011.

#### Problem - Disconnected Customer Data

Nearly 100 million customers purchase eight house brands from Luxottica through the company's numerous websites and retail chain stores. The big data captured from those customer interactions (in the form of transactions, click streams, product reviews, and social media postings) constitutes a massive source of business intelligence for potential product, marketing, and sales opportunities.

Luxottica, however, outsourced both data storage and promotional campaign development and management, leading to a disconnect between data analytics and marketing execution. The outsource model hampered access to current, actionable data, limiting its marketing value and the analytic value of the IBM PureData System for Analytics appliance that Luxottica used for a small segment of its business.

Luxottica's competitive posture and strategic growth initiatives were compromised for lack of an individualized view of its customers and an inability to act decisively and consistently on the different types of information generated by each retail channel. Luxottica needed to be able to exploit all data regardless of source or which internal or external application it resided on. Likewise, the company's marketing team wanted more control over promotional campaigns, including the capacity to gauge campaign effectiveness.

#### Solution - Fine-tuned Marketing

To integrate all data from its multiple internal and external application sources and gain visibility into its customers, Luxottica deployed the Customer Intelligence Appliance (CIA) from IBM Business Partner Aginity LLC.

CIA is an integrated set of adaptable software, hardware, and embedded analytics built on the IBM PureData System for Analytics solution. The combined technologies help Luxottica highly segment customer behavior and provide a platform and smart database for marketing execution systems, such as campaign management, e-mail services and other forms of direct marketing.

IBM® PureData™ for Analytics, which is powered by Netezza data warehousing technology, is one of the leading data appliances for large-scale, real-time analytics. Because of its innovative data storage mechanisms and massively parallel processing capabilities, it simplifies and optimizes performance of data services for analytic applications, enabling very complex algorithms to run in minutes, not hours or days, rapidly delivering invaluable insight to decision makers when they need it.

The IBM and Aginity platform provides Luxottica with unprecedented visibility into a class of customer that is of particular interest to the company: the omni-channel customer. This customer purchases merchandise both online and in-store and tends to shop and spend more than web-only or in-store customers.

"We've equipped their team with tools to gain a 360-degree view of their most profitable sales channel, the omni-channel customers, and individualize the way they market to them," says Ted Westerheide, chief architect for Aginity. "With the Customer Intelligence Appliance and PureData System for Analytics platform, Luxottica is a learning organization, connecting to customer data across multiple channels and improving marketing initiatives from campaign to campaign."

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**Benefits**

Successful implementation of such an advanced big data analytics solution brings about numerous business benefits. In the case of Luxottica, the top three benefits were:

- Anticipates a 10 percent improvement in marketing effectiveness
- Identifies the highest-value customers out of nearly 100 million
- Targets individual customers based on unique preferences and histories

*Source: Sharda, R., Delen, D., Turban, E. (2014). Business Intelligence: A Managerial Approach on Analytics 3/e, Prentice Hall.*

- a. What does “big data” mean to Luxottica? (2 marks)
- b. Explain **TWO (2)** main data/analytics challenges Luxottica was facing. (4 marks)
- c. Explain **ONE (1)** main solution produced by Luxottica. (4 marks)

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